

## REMARKS/ARGUMENTS

Claim 1 has been amended to incorporate the limitations of claim 7, which has now been canceled. Claim 6 has been rewritten as an independent claim. Claim 11 has been amended to incorporate the limitations of claim 12, which has now been canceled. Claims 7, 9 and 12 have been canceled. Claims 20-26 have been added. Claims 1-6, 8, 10-11, and 12-26 are now pending.

The applicants' attorney would like to thank the Examiner for his time during the telephone discussion on November 8, 2004. During the discussion, the claims were discussed with respect to the cited art. No agreement was reached. Amending claim 1 to incorporate the limitations of claim 7 was also discussed.

The Examiner rejected claims 1-5, 11, and 15-19 under 35 U.S.C. 103 (a) as being unpatentable over Applicants' Admitted Prior Art (APA) in view of Douklas (USPN 3,776,616). Claim 1 has been amended to incorporate the limitations of claim 7, which has been canceled. Claim 11 has been amended to incorporate the limitations of claim 12, which has now been canceled. For at least these reasons, claims 1 and 11, as amended, are not made obvious by APA in view of Douklas.

The Examiner further rejected claims 6-10 & 12-14 under 35 U.S.C. 103 (a) as being unpatentable over Applicants' Admitted Prior Art (APA) in view of Baker (USPN 4,913,509) as applied above to claims 1 & 2, and further in view of Sato (JP 0279890 A) and Stone (USPN 5,771,320).

Baker is not applied to claims 1 and 2 above, and therefore cannot be used to render claims 6-10 and 12-14 obvious.

Claim 1 as amended recites testing the switches that are in use and the switches that are standing by as a back-up system. By constantly testing the back up switches, the invention is able to provide reliable back up switches when an active switch fails. This is in contrast to the APA, which did not test back up switches. When an active switch failed in the APA, it was possible that the back up switch would also fail, since constant testing was not done. In such an event, the entire switching system would not operate until the system could be manually replace, which would cause undesired down time. The Examiner argues that input signals are used to test

optical paths, but the Examiner has failed to point out in a reference the teaching of test light sources in addition to input signals that are used to test optical paths.

The Examiner cited Sato as teaching a plurality of optical input switches wherein the controller determines if one of the plurality of optical switches is malfunctioning, and Stone as teaching wherein at least one of a plurality of central optical switches (gratings 20, 25) is a protection optical switch that acts as a back up for said active optical switch, by simultaneously using input signals, which are not generated by the test light sources, to test the active optical switch and test light sources to test the protection optical switch, citing Fig. 1.

Sato does not teach replacing a malfunctioning switch as argued by the Examiner, instead the solution of Sato discusses changing "transmission lines" "when any transmission line has a fault" (See the "Solution" in Sato.). In addition, the Examiner failed to specifically point out anything in Sato that teaches using a controller to determine if a switch is malfunctioning. Instead, as mentioned above, Sato teaches determining if a transmission line is malfunctioning. The Examiner failed to specifically point out anything in Stone that teaches a plurality of switches where one switch acts as a protection optical switch that acts as a back up for the active optical switch and simultaneously using input signals not generated by test light sources to test the active optical switch and test light sources to test the protection optical switch, as recited in claim 1, as amended. FIG. 1 of Stone is a routing system with a first router assembly 18 to provide switching in a horizontal direction and a second router assembly 24 to provide switching in a vertical direction. The applicant did not see anything in Stone that discusses back up switches as recited in claim 1, as amended.

In addition, claim 6 further recites a controller connected to each of the plurality of optical input switches, wherein the controller determines if one of the plurality of central optical switches is malfunctioning by testing a first plurality of optical paths using the test light sources and by simultaneously testing a second plurality of optical paths using input signals, which are not generated by the test light sources. The cited references do not disclose a controller that uses both test light sources and input signals to simultaneously test optical paths. The Examiner argues that input signals are used to test optical paths, but the Examiner has failed to point out in a reference the teaching of test light sources in addition to input signals that are used to test optical paths.

In addition, the Examiner specifically failed to point out anything in references that teach a controller that is connected to test light sources, optical detectors, and the central optical switches as recited in claims 1, 6, and 11, as amended. For at least these reasons, claims 1, 6, and 11, as amended, are not anticipated or made obvious by the cited references.

Claims 2-5, 8-10, and 13-19 each depend either directly or indirectly from the independent claims, and are therefore respectfully submitted to be patentable over the art of record for at least the reasons set forth above with respect to the independent claims. Additionally, these dependent claims require additional elements that, when taken in the context of the claimed invention, further patentably distinguish the art of record. For example, claims 2 and 15 further recite detectors optically connected to the output switches by optical fibers. The cited references do not disclose or suggest connecting detectors to the output switches by optical fibers.

In addition, claims 3 and 16 further recite a second plurality of detectors where each of the second plurality of detectors is connected to optical fibers connected to input connections. Nothing in the cited references teaches or suggests this. The Examiner failed to point to anything in the cited references that teach connecting optical detectors to optical fibers connected to switch inputs.

In addition, claim 4 further recites a third plurality of optical detectors which are each connected to an optical fiber of the first plurality of optical fibers, which are connected between the output connections of the input switches and the input connections of the central optical switches. The Examiner failed to point out anything in cited references that teach or suggest this.

In addition, claim 5 further recites input switches each connected to at least eight fibers of the third plurality of fibers. The Examiner failed to point out anything in cited references that teach monitoring paths through optical switches in a Clos configuration, where the number of input and output ports of the optical switching apparatus is greater than the number of input and output ports of the central switches.

In addition, claim 8 further recites an indicator that indicates if a central optical switch is malfunctioning. The Examiner failed to point out anything in cited references that teach or suggest this.

- For at least these reasons, claims 2-10 and 12-19 are not anticipated or made obvious by the cited references.

Claims 20-26 have been added. Claims 20 and 24 further recite that when the active optical switch malfunctions, the entire protection optical switch replaces the entire active optical switch. Claims 21 and 25 further recite that the controller uses the plurality of test light sources to test the active optical switch when the input lights are not present. Claims 22 and 26 further recite that individual paths of the protection switch are used to replace individual paths of the active switch. Claim 23 incorporates limitations of claim 8, but is dependent on claim 6.

Applicants believe that all pending claims are allowable and respectfully request a Notice of Allowance for this application from the Examiner. Should the Examiner believe that a telephone conference would expedite the prosecution of this application, the undersigned can be reached at telephone number (650) 961-3800.

Respectfully submitted,  
BEYER WEAVER & THOMAS, LLP  
  
Michael Lee  
Registration No. 31,846

P.O. Box 778  
Berkeley, CA 94704-0778  
Telephone: (650) 961-8300